Listing of Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (previously presented) A method of using a computer processor to monitor items being received and disbursed within a predetermined environment, said method comprising:

(a) providing a computer monitoring system having a memory circuit for storage of data, a communications port, and a processing circuit;

(b) providing a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within said predetermined environment;

(c) receiving, by way of said communications port, identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits, and receiving an arrival time, wherein said arrival time is a time when said at least one item was detected by the one of said plurality of sensing circuits;

(d) determining at a later time, by way of said processing circuit, a waiting time for said at least one item, wherein said waiting time is an amount of time between said arrival time and said later time, wherein said later time is prior to a next time said at least one item is again detected by one of said plurality of sensing circuits;

(e) retrieving, from said memory circuit, a probability distribution over inter-arrival times for said at least one item, wherein an inter-arrival time is an amount of time between an arrival of said at least one item and a next arrival of said at least one item, and wherein said probability distribution is retrieved, by way of said processing circuit, based on said identification characteristic information; and

(f) determining, by way of said processing circuit, based on said retrieved probability

distribution, that said waiting time is anomalous if a cumulative probability of all inter-arrival times that are greater than said waiting time is less than a predetermined threshold; and

(g) generating at said later time, by way of said processing circuit, an inter-arrival time event announcement for said at least one item whenever said waiting time is anomalous.

2. (previously presented) The method as recited in claim 1, further comprising updating said probability distribution over inter-arrival times for said at least one item after it passes one of said plurality of sensing circuits.

3. (previously presented) The method as recited in claim 1, further comprising storing said probability distribution in said memory circuit, wherein the step of storing said probability distribution in said memory circuit comprises: creating or modifying an entry in a database that is stored in said memory circuit such that said entry can later be accessed in substantially real time with respect to the occurrence of the step of determining, by way of said processing circuit, whether said waiting time is anomalous.

4. (original) The method as recited in claim 1, wherein said identification characteristic information comprises: an SKU identifier of said at least one item, or a bar code from a label affixed to said at least one item.

5. (previously presented) The method as recited in claim 1, wherein the step of determining, by way of said processing circuit, whether said waiting time is anomalous occurs in substantially real time with respect to the occurrence of said step of determining a waiting time for said at least one item.

6. (previously presented) The method as recited in claim 1, wherein the step of receiving identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits occurs when said at least one item is being sold at a point-of-

sale register within said predetermined environment.

7. (previously presented) The method as recited in claim 1, wherein the step of generating an inter-arrival time event announcement when said waiting time is anomalous is indicative of one of the following conditions: (i) said at least one item is substantially hidden while residing in its correct location on a display shelf; (ii) said at least one item is completely out-of-stock on said display shelf; (iii) said at least one item has been placed at an incorrect location within said predetermined environment, or (iv) access to said at least one item has been substantially prevented by an obstruction.

8. (cancelled)

9. (previously presented) The method as recited in claim 1, wherein said step of determining, by way of said processing circuit, whether said waiting time is anomalous comprises: comparing the waiting time of said at least one item to said probability distribution over inter-arrival times for said at least one item, while taking into consideration at least one of the following factors: varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

10. (previously presented) The method as recited in claim 1, wherein said step of determining whether or not said waiting time is anomalous comprises: comparing the waiting time of said at least one item to said probability distribution over inter-arrival times for said at least one item, while taking into consideration a usage history of items being disbursed and received.

11. (previously presented) The method as recited in claim 1, wherein, if no probability distribution over inter-arrivals times can be retrieved based on said identification characteristic information, then said at least one item is a new item, and a new item event is generated, and a

probability distribution over inter-arrival times is created for said new item.

12. (previously presented) An item monitoring system, comprising:

(a) a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetermined environment;

(b) a computer monitoring system, comprising:

(i) a memory circuit for storage of data, said memory circuit containing a quantity of random access memory (RAM) and a bulk memory storage device;

(ii) a communications port that is connected to at least one of said sensing circuits and to said memory circuit; and

(iii) a processing circuit that is configured to control the flow of data between said memory circuit and said communications port;

(c) said processing circuit also being configured to:

(i) receive, by way of said communications port, identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits, and to receive an arrival time, wherein said arrival time is a time when said at least one item was detected by the one of said plurality of sensing circuits;

(ii) determine at a later time, by way of said processing circuit, a waiting time for said at least one item, wherein said waiting time is an amount of time between said arrival time and said later time, wherein said later time is prior to a next time said at least one item is again detected by one of said plurality of sensing circuits;

(iii) retrieve, from said memory circuit, a probability distribution over inter-arrival times for said at least one item, wherein an inter-arrival time is an amount of time between an arrival of said at least one item and a next arrival of said at least one item, and

wherein said probability distribution is retrieved, by way of said processing circuit, based on said identification characteristic information; and

(iv) determine, by way of said processing circuit, based on said retrieved probability distribution, whether said waiting time is anomalous if a cumulative probability of all inter-arrival times that are greater than said waiting time is less than a predetermined threshold; and

(v) generate at said later time, by way of said processing circuit, an inter-arrival time event announcement for said at least one item whenever said waiting time is anomalous.

13. (previously presented) The item monitoring system as recited in claim 12, further comprising: a point-of-sale controller that is in communication with said plurality of sensing circuits and with said communications port.

14-18. (cancelled)

19. (previously presented) The method as recited in claim 1, wherein said probability distribution comprises a modified Poisson distribution consisting of weighted sums of Poisson distributions.

20. (previously presented) The method as recited in claim 1, further comprising: detecting an out-of-stock event using a probability of observing zero arrivals of said at least one item during said waiting time for said at least one item.

21. (previously presented) The method as recited in claim 20, wherein said out-of-stock event comprises a time interval during which said at least one item appears to be physically out-of-stock, and upon the occurrence of said out-of-stock event, the computer monitoring system summarizes said out-of-stock events, determines their causes, and measures their effect on

revenues, profits, substitute items, and customer behavior.

22. (previously presented) The method as recited in claim 20, wherein said computer monitoring system provides forecasting of inventory or replenishment levels that removes effects of out-of-stock events before generating forecasting reports.

23. (previously presented) The method as recited in claim 1, wherein said probability distribution is determined by training said computer monitoring system by use of one of: (i) historical transaction data, or (ii) transaction data that is gathered in substantially real time.

24. (original) The method as recited in claim 23, wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table or Item Table.

25. (previously presented) The method as recited in claim 1, wherein all said times are redefined in terms of measured cumulative activity in said predetermined environment, and wherein said measured cumulative activity is one of (i) quantity of packaged items sold or processed, (ii) sales in monetary units, or (iii) number of different items in each transaction at a point of sale.

26. (previously presented) The method as recited in claim 1, wherein all said times are redefined in terms of measured cumulative activity in one of a retail store or a category of items in a retail store.

27. (cancelled)

28. (previously presented) The method as recited in claim 1, wherein said probability distribution over inter-arrival times is a Poisson distribution with a parameter lambda that is a function of Base Lambda and Adjustment Alpha, which include information as saved data and lookup tables on: SKU, store, and various effects, including price point, promotion, season,

holiday, time-of-day, day-of-week, and market conditions.

29. (previously presented) The method as recited in claim 28, wherein a median is used to estimate said parameter lambda, thereby reducing bias in an estimate of a true parameter lambda arising from a contaminating effect of historical out-of-stock events.

30. (previously presented) The method as recited in claim 1, wherein each inter-arrival time for said at least one item and a quantity of said at least one item are linked together as a renewal-reward process, in which the quantity of said at least one item is a separate random log-normal variable with a mean beta and a beta variance.

31. (previously presented) The method as recited in claim 30, wherein said mean and variance parameters to the renewal-reward process are not constants, but vary during the inter-arrival time as conditions at said predetermined environment change.

32. (previously presented) The method as recited in claim 1, further comprising: detecting a slow event using a probability of observing more than K arrivals of said at least one item in the time actually observed for K arrivals of said at least one item.

33. (previously presented) The method as recited in claim 1, further comprising: detecting a fast event using a probability of observing less than J arrivals of said at least one item in the time actually observed for J arrivals of said at least one item.

34. (cancelled)

35. (previously presented) The method as recited in claim 1, wherein each inter-arrival time for said at least one time varies as a function of: total predetermined environment traffic, item category traffic, time of day, day of week, season, holidays, and market conditions of said predetermined environment.

36. (previously presented) The method as recited in claim 1, wherein said predetermined

environment comprises one of: a retail store, a chain of retail stores, a warehouse, a chain of warehouses, a distribution point, a chain of distribution points, manufacture's distribution center or a chain of manufacture's distribution centers.

37. (previously presented) The method as recited in claim 23, further comprising: automatically re-training said computer monitoring system on a periodic basis using substantially real time data throughout a periodic interval.

38. (previously presented) The method as recited in claim 37, wherein said re-training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

39. (original) The method as recited in claim 38, wherein said iterative passes comprise: (i) computing Initial Base Lambdas using total store sales and total category sales; (ii) computing Intermediate Base Lambdas using item transaction data and said item's inter-arrival time using said Initial Base Lambdas; (iii) computing Initial Adjustment Alphas using an adjusted item inter-arrival time and a plurality of current effects; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and said item's inter-arrival time; and (v) computing Final Adjustment Alphas using said Final Base Lambdas and a plurality of current effects, and computing a Beta Table.

40. (previously presented) The method as recited in claim 39, wherein said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table are used to calculate a probability distribution of inter-arrival times for said at least one item, and wherein said inter-arrival time is stated either in units of: (i) time, or (ii) quantity of sales in monetary units.

41 – 83. (cancelled)

84. (previously presented) The item monitoring system as recited in claim 12, said

processing circuit also being configured to: update said probability distribution over inter-arrival times for said at least one item after it passes one of said plurality of sensing circuits.

85. (previously presented) The item monitoring system as recited in claim 12, wherein said processing circuit is further configured to detect an out-of-stock event using a probability of observing zero arrivals of said at least one item during said waiting time for said at least one item.

86. (previously presented) The item monitoring system as recited in claim 85, wherein said out-of-stock event comprises a time interval during which said at least one item appears to be physically out-of-stock, and upon the occurrence of said out-of-stock event, the computer monitoring system summarizes said out-of-stock events, determines their causes, and measures their effect on revenues, profits, substitute items, and customer behavior.

87. (previously presented) The item monitoring system as recited in claim 12, wherein said probability distribution is determined by training said computer monitoring system by use of one of: (i) historical transaction data, or (ii) transaction data that is gathered in substantially real time.

88. (original) The item monitoring system as recited in claim 87, wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

89. (previously presented) The item monitoring system as recited in claim 12, wherein all said times are redefined in terms of measured cumulative activity in said predetermined environment, and wherein said measured activity is one of (i) quantity of packaged items sold or processed, (ii) sales in monetary units, or (iii) number of different items in each transaction at a point of sale.

90. (previously presented) The item monitoring system as recited in claim 12, wherein each inter-arrival time for said at least one item and a quantity of said at least one item are linked together as a renewal-reward process, in which the quantity of said at least one item is a separate random log-normal variable with a mean beta and a beta variance.

91. (cancelled)

92. (previously presented) The item monitoring system as recited in claim 12, wherein each inter-arrival time for said at least one item varies as a function of: total predetermined environment traffic, item category traffic, time of day, day of week, season, holidays, and market conditions of said predetermined environment.

93. (previously presented) The item monitoring system as recited in claim 12, wherein said predetermined environment comprises one of: a retail store, a chain of retails stores, a warehouse, a chain of warehouses, a distribution point, or a chain of distribution points.

94. (previously presented) The item monitoring system as recited in claim 12, wherein said processing circuit is further configured to automatically re-train said computer monitoring system on a periodic basis using substantially real time data throughout a periodic interval.

95. (previously presented) The item monitoring system as recited in claim 94, wherein said re-training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

96. (previously presented) The item monitoring system as recited in claim 95, wherein said iterative passes comprise: (i) computing Initial Base Lambdas using total store sales and total category sales; (ii) computing Intermediate Base Lambdas using item transaction data and said item's inter-arrival time using said Initial Base Lambdas; (iii) computing Initial Adjustment

Alphas using an adjusted item inter-arrival time and a plurality of current effects; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and said item's inter-arrival time; and (v) computing Final Adjustment Alphas using said Final Base Lambdas and a plurality of current effects, and computing a Beta Table.

97. (previously presented) The item monitoring system as recited in claim 96, wherein said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table are used to calculate a probability distribution over inter-arrival times for said at least one item, and wherein said inter-arrival time is stated either in units of: quantity or sales in monetary units.

98-101. (cancelled)

102. (previously presented) The item monitoring system as recited in claim 12, said processing circuit also being configured to store said probability distribution in said memory circuit, wherein said memory circuit creates or modifies an entry in a database that is stored in said memory circuit such that said entry can later be accessed in substantially real time with respect to when said processing circuit determines whether said waiting time is anomalous.

103. (previously presented) The item monitoring system as recited in claim 12, wherein said identification characteristic information comprises: an SKU identifier of said at least one item, or a bar code from a label affixed to said at least one item.

104. (previously presented) The item monitoring system as recited in claim 12, wherein said processing circuit determines whether said waiting time is anomalous in substantially real time with respect to when said processing circuit determines a waiting time for said at least one item.

105. (previously presented) The item monitoring system as recited in claim 12, wherein said processing circuit receives identification characteristic information pertaining to said at least

one item as it passes one of said plurality of sensing circuits occurs when said at least one item is being sold at a point-of-sale register within said predetermined environment.

106. (previously presented) The item monitoring system as recited in claim 12, said processing circuit generating an inter-arrival time event announcement when said waiting time is anomalous is indicative of one of the following conditions: (i) said at least one item is substantially hidden while residing in its correct location on a display shelf; (ii) said at least one item is completely out-of-stock on said display shelf; (iii) said at least one item has been placed at an incorrect location within said predetermined environment, or (iv) access to said at least one item has been substantially prevented by an obstruction.

107. (cancelled)

108. (previously presented) The item monitoring system as recited in claim 12, wherein said processing circuit is further configured to determine whether said waiting time is anomalous by comparing said waiting time of said at least one item to said probability distribution over inter-arrival times for said at least one item, while taking into consideration at least one of the following factors: varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

109. (previously presented) The item monitoring system as recited in claim 12, wherein said processing circuit is further configured to determine whether or not said waiting time is anomalous by comparing said waiting time of said at least one item to said probability distribution over inter-arrival times for said at least one item, while taking into consideration a usage history of items being disbursed and received.

110. (previously presented) The item monitoring system as recited in claim 12, wherein if no probability distribution over inter-arrivals times can be retrieved based on said identification

characteristic information, then said at least one item is a new item, and a new item event is generated and a probability distribution over inter-arrival times is created for said new item.

111. (previously presented) The method as recited in claim 1, wherein when said waiting time is stated in units of quantity, said quantity is stated in terms of either the number of unique items sold or the total number of items sold.

112. (previously presented) The item monitoring system as recited in claim 12, wherein when said waiting time is stated in units of quantity, said quantity is stated in terms of either the number of unique items sold or the total number of items sold.

113-116. (cancelled)

117. (previously presented) The method as recited in claim 1, wherein information upon which said probability distribution is retrieved is further comprised of interval information, wherein said interval information is comprised of information about one or more conditions occurring during said waiting time.

118. (previously presented) The method as recited in claim 117, wherein said information about one or more conditions occurring during said waiting time is comprised of information about varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

119. (cancelled)

120. (previously presented) The item monitoring system as recited in claim 12, wherein information upon which said probability distribution is retrieved is comprised of on interval information, wherein said interval information is comprised of information about one or more conditions occurring during said waiting time.

121. (previously presented) The item monitoring system as recited in claim 120, wherein said information about one or more conditions occurring during said waiting time is comprised of information about varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

122-123. (cancelled)

124. (previously presented) A method of using a computer processor to monitor items being received and disbursed within a predetermined environment, said method comprising:

(a) providing a computer monitoring system having a memory circuit for storage of data, a communications port, and a processing circuit;

(b) providing a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within said predetermined environment;

(c) receiving, by way of said communications port, identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits;

(d) receiving, by way of said communications port, a first arrival time, wherein said first arrival time is a first time when said at least one item was detected by the one of said plurality of sensing circuits;

(e) receiving, by way of said communications port, a second arrival time, wherein said second arrival time is a next time said at least one item is again detected by one of said plurality of sensing circuits, and wherein said second arrival time is later than said first arrival time;

(f) determining at a later time, by way of said processing circuit, an observed inter-arrival time for said at least one item, wherein said observed inter-arrival time is an amount of time between said first arrival time and said second arrival time;

(g) retrieving, from said memory circuit, a probability distribution over inter-arrival times for said at least one item, wherein an inter-arrival time is an amount of time between an arrival of said at least one item and a next arrival of said at least one item, and wherein said probability distribution is retrieved, by way of said processing circuit, based on said identification characteristic information;

(h) determining, by way of said processing circuit, based on said retrieved probability distribution, that said observed inter-arrival time is anomalous if a cumulative probability of all inter-arrival times that are less than said observed inter-arrival time is less than a predetermined threshold; and

(i) generating at said later time, by way of said processing circuit, an inter-arrival time event announcement for said at least one item whenever said observed inter-arrival time is anomalous.

125. (previously presented) The method as recited in claim 124, further comprising:

(j) repeating steps (d) – (g) for one to six, additional, consecutive arrivals of said at least one item;

and wherein the step of determining, by way of said processing circuit, based on said retrieved probability distribution, that said observed inter-arrival time is anomalous is based on said one to six, additional, consecutive arrivals of said at least one item.

126. (previously presented) The method as recited in claim 124, further comprising:

(j) repeating steps (d) – (g) for three, additional, consecutive arrivals of said at least one item;

and wherein the step of determining, by way of said processing circuit, based on said retrieved probability distribution, that said observed inter-arrival time is anomalous is based on said three, additional, consecutive arrivals of said at least one item.

127. (previously presented) An item monitoring system, comprising:

(a) a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetermined environment;

(b) a computer monitoring system, comprising:

(i) a memory circuit for storage of data, said memory circuit containing a quantity of random access memory (RAM) and a bulk memory storage device;

(ii) a communications port that is connected to at least one of said sensing circuits and to said memory circuit; and

(iii) a processing circuit that is configured to control the flow of data between said memory circuit and said communications port;

(c) said processing circuit also being configured to:

(i) receive, by way of said communications port, identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits;

(ii) receive, by way of said communications port, a first arrival time, wherein said first arrival time is a first time when said at least one item was detected by the one of said plurality of sensing circuits;

(iii) receive, by way of said communications port, a second arrival time, wherein said second arrival time is a next time said at least one item is again detected by one of said plurality of sensing circuits, and wherein said second arrival time is later than said

first arrival time;

(iv) determine at a later time, by way of said processing circuit, an observed inter-arrival time for said at least one item, wherein said observed inter-arrival time is an amount of time between said first arrival time and said second arrival time;

(v) retrieve, from said memory circuit, a probability distribution over inter-arrival times for said at least one item, wherein an inter-arrival time is an amount of time between an arrival of said at least one item and a next arrival of said at least one item, and wherein said probability distribution is retrieved, by way of said processing circuit, based on said identification characteristic information;

(vi) determine, by way of said processing circuit, based on said retrieved probability distribution, that said observed inter-arrival time is anomalous if a cumulative probability of all inter-arrival times that are less than said observed inter-arrival time is less than a predetermined threshold; and

(vii) generate at said later time, by way of said processing circuit, an inter-arrival time event announcement for said at least one item whenever said observed inter-arrival time is anomalous.

128. (previously presented) The method as recited in claim 1, further comprising: providing a point-of-sale controller that is in communication with said plurality of sensing circuits and with said communications port.

129. (previously presented) The method as recited in claim 1, wherein said probability distribution is retrieved based on varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

130. (previously presented) The item monitoring system as recited in claim 12, wherein

said processing circuit is further configured to retrieve said probability distribution based on varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

131. (previously presented) The item monitoring system as recited in claim 12, wherein said probability distribution comprises a modified Poisson distribution consisting of weighted sums of Poisson distributions.

132. (previously presented) The item monitoring system as recited in claim 85, wherein said computer monitoring system provides forecasting of inventory or replenishment levels that removes effects of out of stock events before generating forecasting reports.

133. (previously presented) The item monitoring system as recited in claim 12, wherein all said times are redefined in terms of measured cumulative activity in one of a retail store or a category of items in a retail store.

134. (previously presented) The item monitoring system as recited in claim 12, wherein said probability distribution over inter-arrival times is a Poisson distribution with a parameter lambda that is a function of Base Lambda and Adjustment Alpha, which include information as saved data and lookup tables on: SKU, store, and various effects, including price point, promotion, season, holiday, time-of-day, day-of-week, and market conditions.

135. (previously presented) The item monitoring system as recited in claim 134, wherein a median is used to estimate said parameter lambda, thereby reducing bias in an estimate of a true parameter lambda arising from a contaminating effect of historical out-of-stock events.

136. (previously presented) The item monitoring system as recited in claim 90, wherein said mean and variance parameters to the renewal-reward process are not constants, but vary during the waiting time as conditions at said predetermined environment change.

137. (previously presented) The item monitoring system as recited in claim 12, said processing circuit also being configured to detect a slow event using a probability of observing more than K arrivals of said at least one item in the time actually observed for K arrivals of said at least one item.

138. (previously presented) The item monitoring system as recited in claim 12, said processing circuit also being configured to detect a fast event using a probability of observing less than J arrivals of said at least one item in the time actually observed for J arrivals of said at least one item.

139. (previously presented) The item monitoring system as recited in claim 127, further comprising:

(j) repeating steps (d) – (g) for one to six, additional, consecutive arrivals of said at least one item;

and wherein the step of determining, by way of said processing circuit, based on said retrieved probability distribution, that said observed inter-arrival time is anomalous is based on said one to six, additional, consecutive arrivals of said at least one item.

140. (previously presented) The item monitoring system as recited in claim 127, further comprising:

(j) repeating steps (d) – (g) for three, additional, consecutive arrivals of said at least one item;

and wherein the step of determining, by way of said processing circuit, based on said retrieved probability distribution, that said observed inter-arrival time is anomalous is based on said three, additional, consecutive arrivals of said at least one item.

141. (previously presented) The method as recited in claim 124, further comprising

updating said probability distribution over inter-arrival times for said at least one item after it passes one of said plurality of sensing circuits.

142. (previously presented) The method as recited in claim 124, further comprising storing said probability distribution in said memory circuit, wherein the step of storing said probability distribution in said memory circuit comprises: creating or modifying an entry in a database that is stored in said memory circuit such that said entry can later be accessed in substantially real time with respect to the occurrence of the step of determining, by way of said processing circuit, whether said observed inter-arrival time is anomalous.

143. (previously presented) The method as recited in claim 124, wherein said identification characteristic information comprises: an SKU identifier of said at least one item, or a bar code from a label affixed to said at least one item.

144. (previously presented) The method as recited in claim 124, wherein the step of determining, by way of said processing circuit, whether said observed inter-arrival time is anomalous occurs in substantially real time with respect to the occurrence of said step of determining an observed inter-arrival time for said at least one item.

145. (previously presented) The method as recited in claim 124, wherein the step of receiving identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits occurs in substantially real time with respect to said at least one item is being sold at a point-of-sale register within said predetermined environment.

146. (previously presented) The method as recited in claim 124, wherein said step of determining, by way of said processing circuit, whether said observed inter-arrival time is anomalous comprises: comparing said observed inter-arrival time of said at least one item to said probability distribution over inter-arrival times for said at least one item, while taking into

consideration at least one of the following factors: varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

147. (previously presented) The method as recited in claim 124, wherein said step of determining whether or not said observed inter-arrival time is anomalous comprises: comparing said observed inter-arrival time of said at least one item to said probability distribution over inter-arrival times for said at least one item, while taking into consideration a usage history of items being disbursed and received.

148. (previously presented) The method as recited in claim 124, wherein , if no probability distribution over inter-arrivals times can be retrieved based on said identification characteristic information, then said at least one item is a new item, and a new item event is generated, and a probability distribution over inter-arrival times is created for said new item.

149. (previously presented) The method as recited in claim 124, wherein said probability distribution comprises a modified Poisson distribution consisting of weighted sums of Poisson distributions.

150. (previously presented) The method as recited in claim 124, wherein said probability distribution is determined by training said computer monitoring system by use of one of: (i) historical transaction data, or (ii) transaction data that is gathered in substantially real time.

151. (previously presented) The method as recited in claim 150, wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table or Item Table.

152. (previously presented) The method as recited in claim 124, wherein all said times are redefined in terms of measured cumulative activity in said predetermined environment, and wherein said measured cumulative activity is one of (i) quantity of packaged items sold or

processed, (ii) sales in monetary units, or (iii) number of different items in each transaction at a point of sale.

153. (previously presented) The method as recited in claim 124, wherein all said times are redefined in terms of measured cumulative activity in one of a retail store or a category of items in a retail store.

154. (previously presented) The method as recited in claim 124, wherein said probability distribution over inter-arrival times is a Poisson distribution with a lambda parameter that is a function of Base Lambda and Adjustment Alpha, which include information as saved data and lookup tables on: SKU, store, and various effects, including price point, promotion, season, holiday, time-of-day, day-of-week, and market conditions.

155. (previously presented) The method as recited in claim 154, wherein a median is used to estimate said parameter lambda, thereby reducing bias in an estimate of a true parameter lambda arising from a contaminating effect of historical out-of-stock events.

156. (previously presented) The method as recited in claim 124, each observed inter-arrival time for said at least one item and a quantity of said at least one item are linked together as a renewal-reward process, in which the quantity of said at least one item is a separate random log-normal variable with a mean beta and a beta variance.

157. (previously presented) The method as recited in claim 156, wherein said mean and variance parameters to the renewal-reward process are not constants, but vary during the observed inter-arrival time as conditions at said predetermined environment change.

158. (previously presented) The method as recited in claim 124, further comprising: detecting a slow event using a probability of observing more than K arrivals of said at least one item in the time actually observed for K arrivals of said at least one item.

159. (previously presented) The method as recited in claim 124, further comprising: detecting a fast event using a probability of observing less than J arrivals of said at least one item in the time actually observed for J arrivals of said at least one item.

160. (previously presented) The method as recited in claim 124, wherein each observed inter-arrival time for said at least one time varies as a function of: total predetermined environment traffic, item category traffic, time of day, day of week, season, holidays, and market conditions of said predetermined environment.

161. (previously presented) The method as recited in claim 124, wherein said predetermined environment comprises one of: a retail store, a chain of retails stores, a warehouse, a chain of warehouses, a distribution point, a chain of distribution points, manufacture's distribution center or a chain of manufacture's distribution centers.

162. (previously presented) The method as recited in claim 124, further comprising: automatically re-training said computer monitoring system on a periodic basis using substantially real time data throughout a periodic interval.

163. (previously presented) The method as recited in claim 162, wherein said re-training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

164. (previously presented) The method as recited in claim 163, wherein said iterative passes comprise: (i) computing Initial Base Lambdas using total store sales and total category sales; (ii) computing Intermediate Base Lambdas using item transaction data and said item's inter-arrival time using said Initial Base Lambdas; (iii) computing Initial Adjustment Alphas using an adjusted item inter-arrival time and a plurality of current effects; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and said

item's inter-arrival time; and (v) computing Final Adjustment Alphas using said Final Base Lambdas and a plurality of current effects, and computing a Beta Table.

165. (previously presented) The method as recited in claim 164, wherein said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table are used to calculate a probability distribution of inter-arrival times for said at least one item, and wherein said inter-arrival time is stated either in units of: (i) time, or (ii) quantity of sales in monetary units.

166. (previously presented) The method as recited in claim 124, wherein when said observed inter-arrival time is stated in units of quantity, said quantity is stated in terms of either the number of unique items sold or the total number of items sold.

167. (previously presented) The method as recited in claim 124, wherein information upon which said probability distribution is retrieved is further comprised of interval information, wherein said interval information is comprised of information about one or more conditions occurring during said observed inter-arrival time.

168. (previously presented) The method as recited in claim 167, wherein said information about one or more conditions occurring during said observed inter-arrival time is comprised of information about varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

169. (previously presented) The method as recited in claim 124, further comprising: providing a point-of-sale controller that is in communication with said plurality of sensing circuits and with said communications port.

170. (previously presented) The method as recited in claim 124, wherein said probability distribution is retrieved based on varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

171. (previously presented) The item monitoring system as recited in claim 127, said processing circuit also being configured to update said probability distribution over inter-arrival times for said at least one item after it passes one of said plurality of sensing circuits.

172. (previously presented) The item monitoring system as recited in claim 127, said processing circuit also being configured to store said probability distribution in said memory circuit, wherein said memory circuit creates or modifies an entry in a database that is stored in said memory circuit such that said entry can later be accessed in substantially real time with respect to when said processing circuit determines whether said observed inter-arrival time is anomalous.

173. (previously presented) The item monitoring system as recited in claim 127, wherein said identification characteristic information comprises: an SKU identifier of said at least one item, or a bar code from a label affixed to said at least one item.

174. (previously presented) The item monitoring system as recited in claim 127, wherein said processing circuit determines whether said observed inter-arrival time is anomalous in substantially real time with respect to when said processing circuit determines an observed inter-arrival time for said at least one item.

175. (previously presented) The item monitoring system as recited in claim 127, wherein said processing circuit receives identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits occurs when said at least one item is being sold at a point-of-sale register within said predetermined environment.

176. (previously presented) The item monitoring system as recited in claim 127, said processing circuit generating an inter-arrival time event announcement when said observed inter-arrival time is anomalous is indicative of one of the following conditions: (i) said at least one

item is substantially hidden while residing in its correct location on a display shelf; (ii) said at least one item is completely out-of-stock on said display shelf; (iii) said at least one item has been placed at an incorrect location within said predetermined environment, or (iv) access to said at least one item has been substantially prevented by an obstruction.

177. (previously presented) The item monitoring system as recited in claim 127, wherein said processing circuit is further configured to determine whether said observed inter-arrival time is anomalous by comparing said observed inter-arrival time of said at least one item to said probability distribution over inter-arrival times for said at least one item, while taking into consideration at least one of the following factors: varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

178. (previously presented) The item monitoring system as recited in claim 127, wherein said processing circuit is further configured to determine whether or not said observed inter-arrival time is anomalous by comparing said observed inter-arrival time of said at least one item to said probability distribution over inter-arrival times for said at least one item, while taking into consideration a usage history of items being disbursed and received.

179. (previously presented) The item monitoring system as recited in claim 127, if no probability distribution over inter-arrivals times can be retrieved based on said identification characteristic information, then said at least one item is a new item, and a new item event is generated and a probability distribution over inter-arrival times is created for said new item.

180. (previously presented) The item monitoring system as recited in claim 127, further comprising: a point-of-sale controller that is in communication with said plurality of sensing circuits and with said communications port.

181. (previously presented) The item monitoring system as recited in claim 127, wherein

said probability distribution comprises a modified Poisson distribution consisting of weighted sums of Poisson distributions.

182. (previously presented) The item monitoring system as recited in claim 127, wherein said probability distribution is determined by training said computer monitoring system by use of one of: (i) historical transaction data, or (ii) transaction data that is gathered in substantially real time.

183. (previously presented) The item monitoring system as recited in claim 182, wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

184. (previously presented) The item monitoring system as recited in claim 127, wherein all said times are redefined in terms of measured cumulative activity in said predetermined environment, and wherein said measured activity is one of (i) quantity of packaged items sold or processed, (ii) sales in monetary units, or (iii) number of different items in each transaction at a point of sale.

185. (previously presented) The item monitoring system as recited in claim 127, wherein all said times are redefined in terms of measured cumulative activity in one of a retail store or a category of items in a retail store.

186. (previously presented) The item monitoring system as recited in claim 127, wherein said probability distribution over inter-arrival times is a Poisson distribution with a parameter lambda that is a function of Base Lambda and Adjustment Alpha, which include information as saved data and lookup tables on: SKU, store, and various effects, including price point, promotion, season, holiday, time-of-day, day-of-week, and market conditions.

187. (previously presented) The item monitoring system as recited in claim 186, wherein

a median is used to estimate said parameter lambda, thereby reducing bias in an estimate of a true parameter lambda arising from a contaminating effect of historical out-of-stock events.

188. (previously presented) The item monitoring system as recited in claim 187, wherein said mean and variance parameters to the renewal-reward process are not constants, but vary during the observed inter-arrival time as conditions at said predetermined environment change.

189. (previously presented) The item monitoring system as recited in claim 127, wherein each observed inter-arrival time for said at least one item and a quantity of said at least one item are linked together as a renewal-reward process, in which the quantity of said at least one item is a separate random log-normal variable with a mean beta and a beta variance.

190. (previously presented) The item monitoring system as recited in claim 127, said processing circuit also being configured to detect a slow event using a probability of observing more than K arrivals of said at least one item in the time actually observed for K arrivals of said at least one item.

191. (previously presented) The item monitoring system as recited in claim 127, said processing circuit also being configured to detect a fast event using a probability of observing less than J arrivals of said at least one item in the time actually observed for J arrivals of said at least one item.

192. (previously presented) The item monitoring system as recited in claim 127, wherein each observed inter-arrival time for said at least one item varies as a function of: total predetermined environment traffic, item category traffic, time of day, day of week, season, holidays, and market conditions of said predetermined environment.

193. (previously presented) The item monitoring system as recited in claim 127, wherein said predetermined environment comprises one of: a retail store, a chain of retails stores, a

warehouse, a chain of warehouses, a distribution point, or a chain of distribution points.

194. (previously presented) The item monitoring system as recited in claim 127, wherein said processing circuit is further configured to automatically re-train said computer monitoring system on a periodic basis using substantially real time data throughout a periodic interval.

195. (previously presented) The item monitoring system as recited in claim 194, wherein said re-training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

196. (previously presented) The item monitoring system as recited in claim 195, wherein said iterative passes comprise: (i) computing Initial Base Lambdas using total store sales and total category sales; (ii) computing Intermediate Base Lambdas using item transaction data and said item's inter-arrival time using said Initial Base Lambdas; (iii) computing Initial Adjustment Alphas using an adjusted item inter-arrival time and a plurality of current effects; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and said item's inter-arrival time; and (v) computing Final Adjustment Alphas using said Final Base Lambdas and a plurality of current effects, and computing a Beta Table.

197. (previously presented) The item monitoring system as recited in claim 196, wherein said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table are used to calculate a probability distribution over inter-arrival times for said at least one item, and wherein said inter-arrival time is stated either in units of: quantity or sales in monetary units.

198. (previously presented) The item monitoring system as recited in claim 127, wherein when said observed inter-arrival time is stated in units of quantity, said quantity is stated in terms of either the number of unique items sold or the total number of items sold.

199. (previously presented) The item monitoring system as recited in claim 127, wherein information upon which said probability distribution is retrieved is comprised of on interval information, wherein said interval information is comprised of information about one or more conditions occurring during said observed inter-arrival time.

200. (previously presented) The item monitoring system as recited in claim 199, wherein said information about one or more conditions occurring during said observed inter-arrival time is comprised of information about varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.

201. (previously presented) The item monitoring system as recited in claim 127, wherein said processing circuit is further configured to retrieve said probability distribution based on varying price conditions, time of day, day of week, week of year, holidays, promotion activities, or competitive activities.